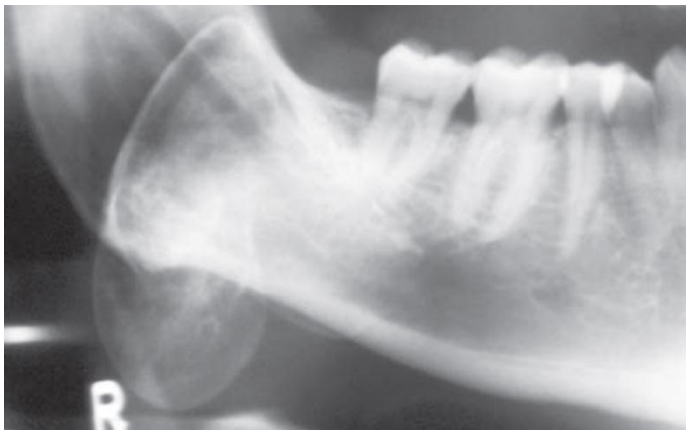
Benign non odontogenic tumors of the bone

Osteoma

Osteomas are benign tumors that consist of mature, compact, or cancellous bone. Osteomas that arise on the surface of bone are referred to as periosteal osteomas, whereas those that develop centrally within bone are endosteal or solitary central osteomas. Osteomas are relatively rare in the jaws. The cause of these lesions is unknown, although (trauma, infection, genetic/congenital, and developmental abnormalities) have been suggested as contributing factors.

Clinical Features

- most commonly identified during the second to fifth decades of life. Males are affected more often than females.
- usually solitary, except in patients with Gardner syndrome.
- Periosteal osteomas present clinically as asymptomatic, slow-growing, bony, hard masses. Asymmetry may be noted when lesions enlarge to sufficient proportion.
- Endosteal osteomas occurring within medullary bone may be discovered during routine radiographic examination as dense, well-circumscribed radiopacities, because extensive growth must take place before cortical expansion is evident.
- approximately 70% of cases located within the mandible as well as in facial and skull bones and within paranasal sinuses. Symptoms occasionally accompany these tumors. Headaches, recurrent sinusitis, and ophthalmologic complaints have been noted, depending on the lesion location.

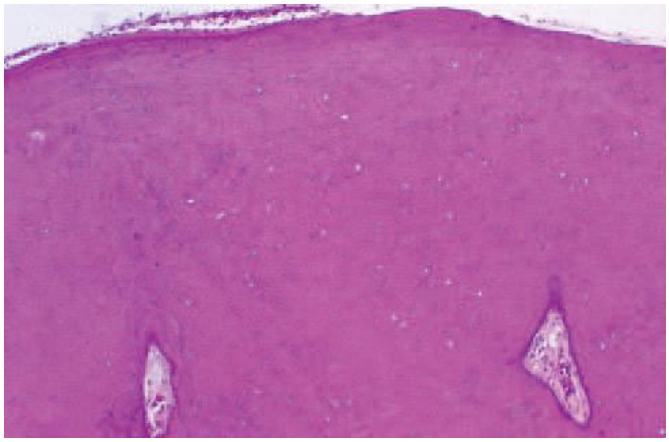


pedunculated cancellous osteoma arising from the lingual surface of the mandible near the crest of the alveolar ridge.

Histopathology

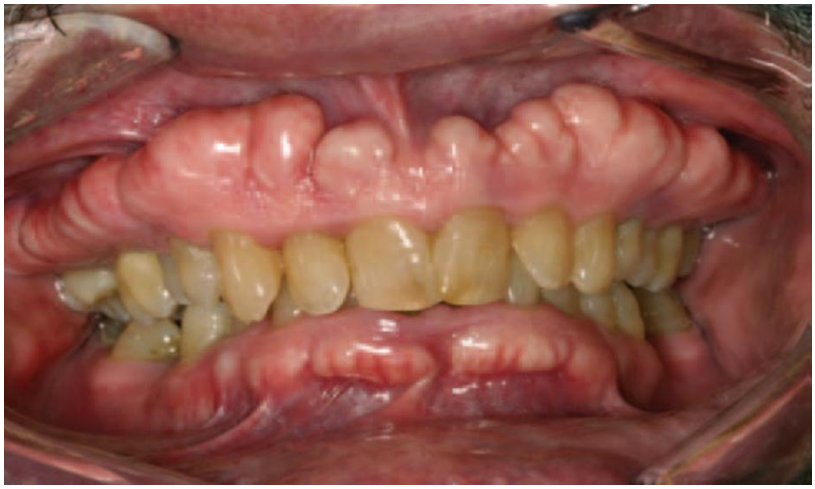
Two distinct histologic variants of osteoma have been described. One form is composed of relatively dense, compact bone with sparse marrow tissue. The other form consists of lamellar trabeculae of cancellous bone with abundant fibrofatty marrow. Osteoblasts may be numerous, but osteoclasts are sparse

Compact osteoma



Differential Diagnosis

- Bony exostoses are bony excrescences on the buccal aspect of alveolar bone. These lesions are of reactive or developmental origin.
- Osteoblastomas and osteoid osteomas, which might also be considered in a differential diagnosis, are likely to be painful and may exhibit a more rapid rate of growth than osteomas.
- Osteomas may be confused radiographically with odontomas, cementoblastoma, condensing osteitis, osteoblastoma, and focal sclerosing osteomyelitis.



Bony exostoses

Treatment and Prognosis

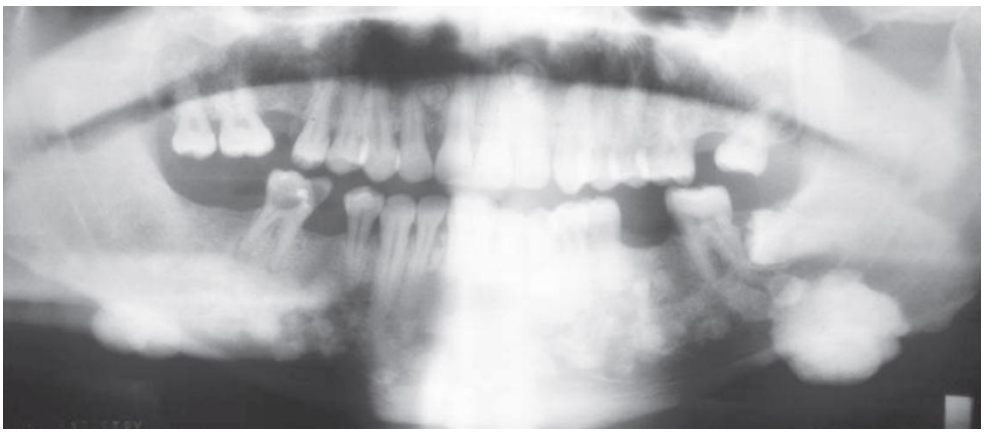
Treatment of osteoma consists of surgical excision if symptomatic. Lesions should be excised for the purpose of confirming the diagnosis in such cases. In some instances, periodic observation of small, asymptomatic osteomas is appropriate treatment. Osteomas do not recur following surgical removal.

Gardner syndrome

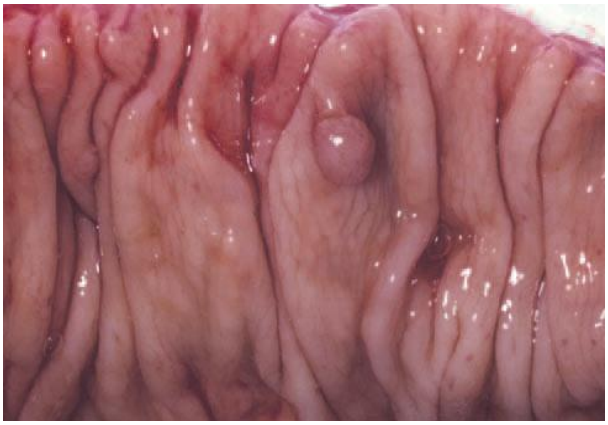
It is inherited as an autosomal-dominant disorder characterized by :

- intestinal polyposis
- multiple osteomas
- fibromas of the skin
- epidermal and trichilemmal cysts
- impacted permanent and supernumerary teeth
- odontomas

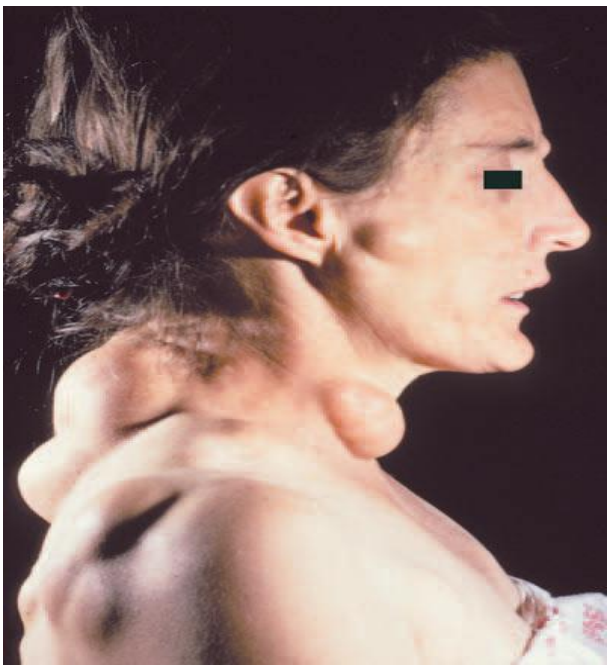
The responsible gene has been mapped to the long arm of chromosome 5 and has been identified as the adenomatous polyposis coli (APC) tumor suppressor gene. Most patients with Gardner's syndrome do not exhibit the complete spectrum of clinical disease expression. Osteomas associated with this syndrome may be found in the jaws (especially the mandibular angle) and in facial and long bones. Intestinal polyps associated with Gardner syndrome are commonly located in the colon and rectum. Significantly, these polyps, found microscopically to be adenomas, exhibit a very high rate of malignant transformation to invasive colorectal carcinoma.



Gardner syndrome. Panoramic radiograph showing multiple osteomas of the mandible.



Gardner syndrome. A segment of resected large bowel showing polyp formation (arrow).



Gardner syndrome: This patient has multiple, large epidermoid cysts

Osteoblastoma/Osteoid Osteoma

Osteoblastoma is an uncommon primary lesion of bone that occasionally arises in the maxilla or the mandible. Osteoid osteoma is thought to represent a smaller version of the same tumor, although some prefer to separate these lesions into two distinct entities. These are benign neoplasms arise from osteoblasts and are of undetermined cause, although a

genetic defect has been suggested. Clinically and histologically, they may be confused with osteosarcoma.

Differences between osteoid osteoma and osteoblastoma:

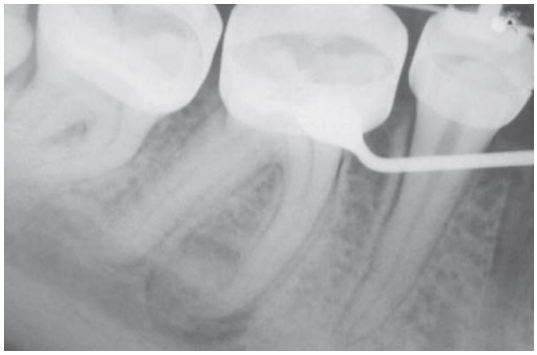
1. The term osteoblastomas is used for lesions larger than 1.5 cm in diameter while osteoid osteoma is used for lesions measuring 1.5 cm or less.

2. Pain (50% of the cases) often quite severe, is usually associated with osteoid osteoma and can also be a feature of osteoblastoma but in osteoid osteoma, aspirin and other nonsteroidal anti-inflammatory drugs usually relieve symptoms, including nocturnal pain. This relief is less likely to be seen with osteoblastoma.

3. The most frequently affected bones in osteoblastoma are the vertebral column, sacrum, calvarium, long bones, and the small bones of the hands and feet. Osteoid osteomas occur most often in the femur, tibia, and phalanges. Both lesions are rare in the jaw bones.

4. Radiographically Sclerosis of perilesional bone, a constant feature of osteoid osteoma, may be absent in osteoblastoma.

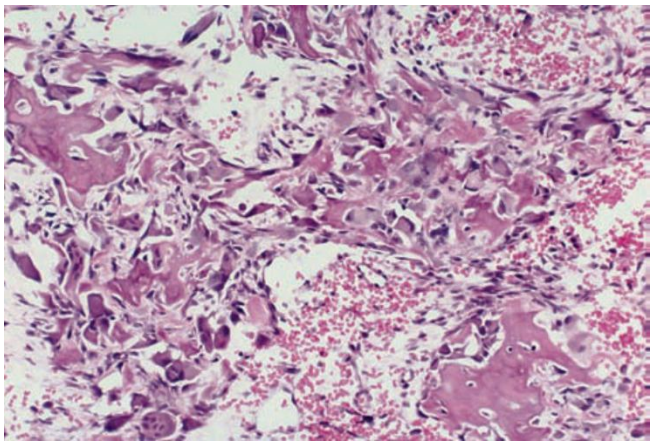
Radiographically both lesions are well circumscribed and have a lytic to mixed lucent-opaque pattern. A thin radiolucency may be noted surrounding a variably calcified central tumor mass. Sclerosis of perilesional bone, a constant feature of osteoid osteoma, may be absent in osteoblastoma. Occasionally, a peripheral sun- ray pattern of new bone production may mimic osteosarcoma.



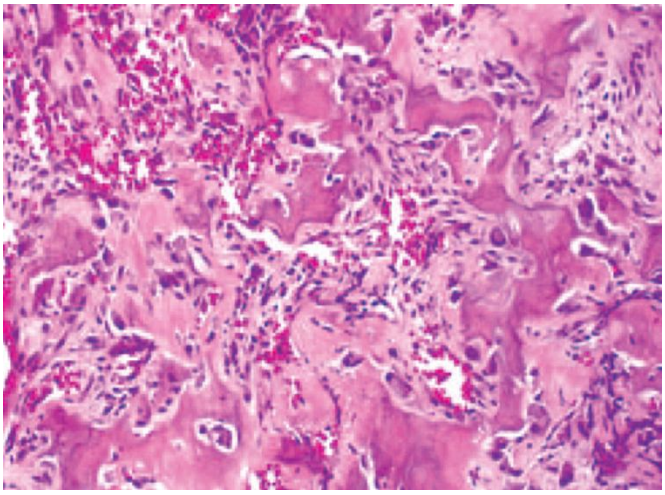
Osteoid osteoma. A circumscribed, mixed radiolucent and radiopaque lesion near the apex of mesial root of mandibular first molar.

Histopathology

These lesions are composed of irregular trabeculae of osteoid and immature bone within a stroma containing a prominent vascular network. The bony trabeculae exhibit various degrees of calcification. Remodeling of the osseous tissue may be evident in the form of basophilic reversal lines. Several layers of plump, hyperchromatic osteoblasts typically line the bony trabeculae. Stromal cells are generally small and slender, although osteoblast like cells and multinucleated giant cells may be noted in these areas.



Osteoblastoma showing abundant prominent osteoblasts adjacent to new bone.



irregular bony trabeculae with prominent osteoblastic rimming and osteoclasts.

Differential Diagnosis

The Differential diagnosis considerations include:

- cementoblastoma
- ossifying fibroma
- fibrous dysplasia
- osteosarcoma.

Treatment and Prognosis

A conservative surgical approach (curettage or local excision) is curative in virtually all cases. In rare instances, these tumors have been associated with a tendency to invade tissues locally and to recur subsequently. The term aggressive osteoblastoma has been suggested for such lesions, but most authorities believe that this is an unnecessary subclassification. Rare examples of malignant transformation of osteoblastoma have also been reported.

Desmoplastic fibroma

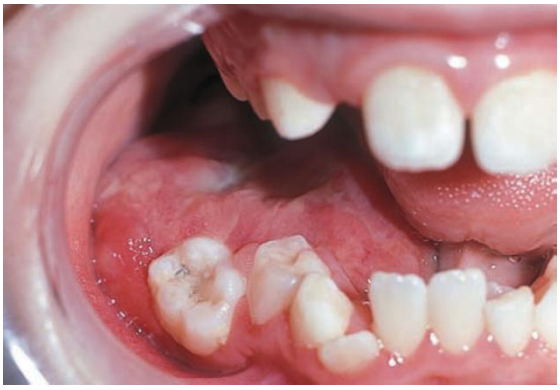
DF is a benign, locally aggressive lesion of bone that can be considered the bony counterpart of fibromatosis at both gnathic and extragnathic locations. The tumor occasionally affects the jaws. The cause of desmoplastic fibroma is unknown. The lesion usually exhibits locally aggressive clinical behavior (suggesting a neoplastic process). The potential role of genetic, endocrine, and traumatic factors in the pathogenesis of the lesion has led to speculation that it might represent an exuberant reactive proliferation.

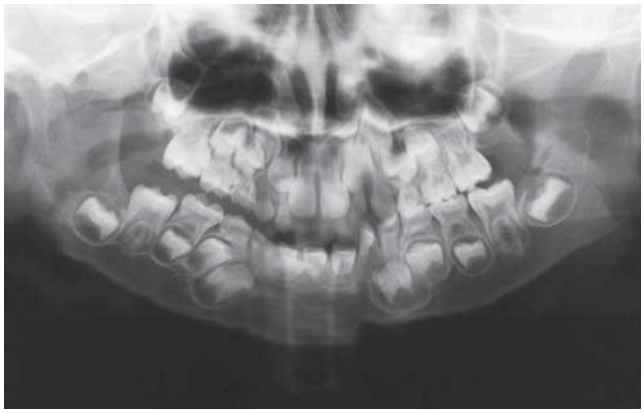
Clinical Features

Most cases occurred in patients younger than 30 years. The mandible, usually the body-ramus region, is affected more often than the maxilla.

The lesions are slowly progressive and asymptomatic, eventually causing swelling of the jaw.

Radiographically, desmoplastic fibroma may be unilocular or multilocular. The radiographic margins may be well demarcated or poorly defined. Cortical perforation and root resorption may be seen.

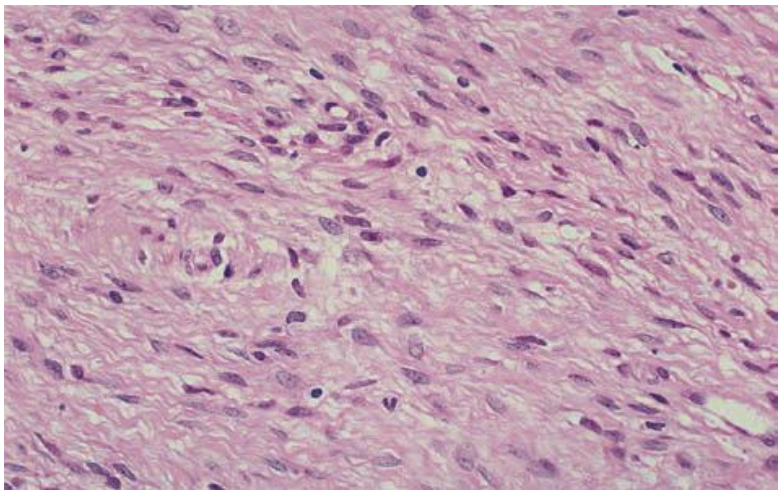




Desmoplastic fibroma in the right ramus of a 7-year-old boy.

Histopathology

The lesion consists of interlacing bundles and whorled aggregates of densely collagenous tissue that contains uniform spindled and elongated fibroblasts Some areas may exhibit hypercellularity with plumper fibroblast nuclei. cytologic atypia and mitotic figures are not found. Bone is not produced by lesional tissue.



Desmoplastic fibroma. Note evenly distributed and benign-appearing fibroblasts in collagenous stroma.

Differential Diagnosis

Differential radiographic diagnostic considerations include odontogenic cysts, odontogenic tumors, and nonodontogenic lesions that typically occur in this age group. The presence of aggressive features, such as cortical perforation, or local symptoms might suggest the possibility of a malignancy. In some cases, histopathologic distinction between desmoplastic fibroma and well-differentiated fibrosarcoma may be difficult. Fibrosarcoma exhibits greater cellularity, mitotic figures, and nuclear pleomorphism. Some similarities are noted histologically with central odontogenic fibroma, a nonaggressive lesion that contains odontogenic rests

Treatment and Prognosis

Surgical resection of the lesion is generally reported as the treatment of choice. Curettage alone has been associated with a significant recurrence rate.

Hemangioma of Bone

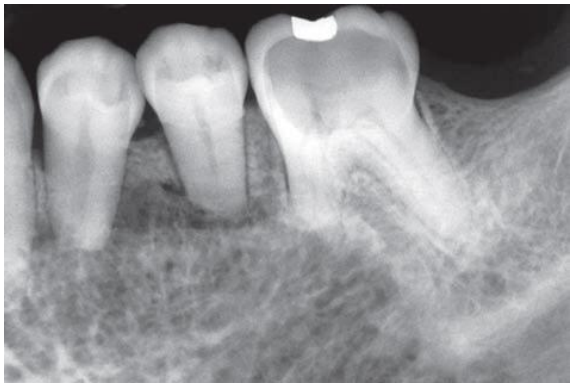
Hemangiomas of bone are rare intraosseous vascular malformations that, when seen in the jaws, can mimic both odontogenic and nonodontogenic lesions. Difficult to control hemorrhage is a notable complication of surgical intervention.

Clinical Features

More than half of central hemangiomas of the jaws occur in the mandible, especially the posterior region. The lesion occurs approximately twice as often in females as in males. The peak age of discovery is the second decade of life. A firm, slow-growing, asymmetric expansion of the mandible or maxilla is the most common patient complaint. Spontaneous gingival bleeding around teeth in the area of the hemangioma may also be noted. Paresthesia or pain, as well as vertical mobility of involved teeth, is occasionally evident. Bruits or pulsation of large lesions may be detected with careful auscultation or palpation of the thinned cortical plates. Significantly, hemangiomas may be present with no signs or symptoms.

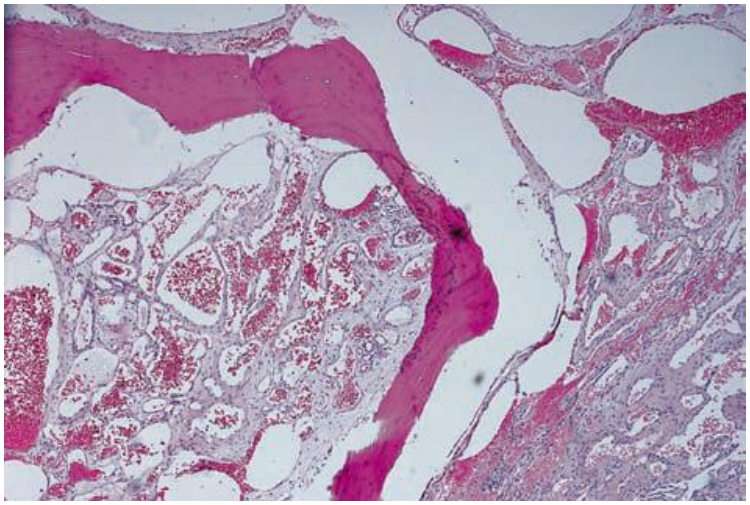
Radiographically

more than half of jaw hemangiomas occur as multilocular radiolucencies that have a characteristic soap bubble appearance. A second form of these lesions consists of a rounded, radiolucent lesion in which bony trabeculae radiate from the center of the lesion, producing angular loculations. Less commonly, hemangiomas appear as cyst-like radiolucencies. The lesions may produce resorption of the roots of teeth in the area.



Histopathology

Hemangiomas of bone represent a proliferation of blood vessels. Most intrabony hemangiomas are of the cavernous type (large-caliber vessels), while fewer are of the capillary type (small-caliber vessels). However, separation of hemangiomas into one of these two microscopic subtypes is academic, because no differences in biological behavior are noted.



Hemangioma of bone. Note numerous vascular channels surrounded by trabeculae of bone.

Treatment and Prognosis

The most significant feature of hemangioma of bone is that these lesions may prove life threatening if improperly managed. Extraction of teeth in an area involved by a central vascular lesion may result in potentially fatal bleeding. It is imperative to perform needle aspiration of any central lesion that may be of vascular origin before performing a biopsy. Methods used in the treatment of hemangioma of bone include surgery, radiation therapy, sclerosing agents, cryotherapy, and presurgical embolization techniques. The vascular supply of a given lesion, as well as its size and location, must be evaluated before a given treatment method is selected.